

APPENDIX A

Parties Filing Pleadings**I. Pleadings in Response to the *Part 25 Earth Station Streamlining NPRM*****A. Comments, filed March 26, 2001 (Earth Station Comments)**

1. Aloha Networks, Inc. (Aloha Networks)
2. Andrew Corporation
3. Astrolink International LLC (Astrolink)
4. GE American Communications, Inc. (GE Americom)¹
5. Globalstar USA, Inc. and Globalstar, L.P. (Globalstar)
6. Hughes Network Systems, Hughes Communications, Inc., and Hughes Communications Galaxy, Inc. (together, Hughes)
7. Loral Space & Communications Ltd. (Loral)
8. Motient Services, Inc. (Motient)
9. New Skies Satellites N.V. (New Skies)
10. PanAmSat Corporation (PanAmSat)²
11. Spacenet, Inc., and StarBand Communications, Inc. (together, Spacenet)
12. Telesat Canada (Telesat)
13. WorldCom, Inc. (WorldCom)

B. Replies, filed May 7, 2001 (Earth Station Replies)

1. Aloha Networks³
2. Astrolink
3. Comtech Mobile Datacom Corp. (CMDCC)
4. GE Americom
5. Hughes
6. National Radio Astronomy Observatory (NRAO)
7. OnSat Network Communications, Inc. (Onsat)
8. PanAmSat
9. Satellite Industry Association (SIA)
10. Spacenet
11. Telesat

¹ GE Americom filed its comments and its reply in this proceeding before the International and Wireless Telecommunications Bureaus granted its application to merge with SES Global S.A. Application of General Electric Capital Corporation, Transferors, and SES Global, S.A., Transferees, *Order and Authorization*, 16 FCC Rcd 17575 (Int'l Bur. and Wireless Bur., 2001).

² On April 10, 2001, PanAmSat corrected certain minor errors and re-filed its comments.

³ On May 9, 2001, Aloha Networks corrected certain minor errors and re-filed its reply.

II. Pleadings in Response to the *Space Station Reform NPRM***A. Comments, filed June 3, 2002 (Space Station Comments)**

1. Boeing Company (Boeing)
2. Cellular Telecommunications & Internet Association (CTIA)
3. Final Analysis Communication Services, Inc. (Final Analysis)
4. Hughes Network Systems, Inc., Hughes Communications, Inc., and Hughes Communications Galaxy, Inc. (Hughes)
5. Inmarsat Ventures PLC (Inmarsat)
6. Intelsat LLC (Intelsat)
7. PanAmSat Corporation (PanAmSat)
8. Pegasus Development Corporation (Pegasus)
9. Satellite Industry Association (SIA)
10. SES Americom, Inc. (SES Americom)
11. Teledesic LLC (Teledesic)
12. Telesat Canada (Telesat)

B. Replies, filed July 2, 2002 (Space Station Replies)

1. ICO Global Communications (Holdings) Ltd. (ICO)
2. Intelsat
3. ORBCOMM LLC (Orbcomm)
4. PanAmSat
5. SES Americom
6. Teledesic
7. Telesat

APPENDIX B

Rule Revisions

For the reasons discussed above, the Federal Communications Commission amends title 47 of the Code of Federal Regulations, part 25, as follows:

PART 25 -- SATELLITE COMMUNICATIONS

1. The authority citation for Part 25 continues to read as follows:

Authority: 47 U.S.C. 701-744. Interprets or applies Sections 4, 301, 302, 303, 307, 309, and 332 of the Communications Act, as amended, 47 U.S.C. Sections 154, 301, 302, 303, 307, 309, 332, unless otherwise noted.

2. Amend §25.103 by revising paragraphs (b) and (c)(2) to read as follows:

§25.103 Definitions.

* * * * *

(b) Authorized carrier. The term "authorized carrier" means a communications common carrier which is authorized by the Federal Communications Commission under the Communications Act of 1934, as amended, to provide services by means of communications satellites.

(c) * * *

(2) The corporation shall be deemed to be a common carrier within the meaning of section 3(10) of the Communications Act of 1934, as amended.

* * * * *

3. Amend §25.111 by revising paragraph (b) to read as follows:

§25.111 Additional information.

* * * * *

(b) Applicants, permittees and licensees of radio stations governed by this part shall provide the Commission with all information it requires for the Advance Publication, Coordination and Notification of frequency assignments pursuant to the international Radio Regulations. No protection from interference caused by radio stations authorized by other Administrations is guaranteed unless coordination procedures are timely completed or, with respect to individual administrations, by successfully completing coordination agreements. Any radio station authorization for which coordination has not been completed may be subject to additional terms and conditions as required to effect coordination of the frequency assignments with other Administrations.

4. Revise Section 25.114 to read as follows:

§25.114 Applications for space station authorizations.

(a) A comprehensive proposal shall be submitted for each proposed space station on FCC Form 312, Main Form and Schedule S, together with attached exhibits as described in paragraph (d) of this section. If an applicant is proposing more than one space station, information common to all space stations may be submitted in a consolidated system proposal.

(b) Each application for a new or modified space station authorization must constitute a concrete proposal for Commission evaluation. Each application must also contain the formal waiver required by Section 304 of the Communications Act, 47 U.S.C. 304. The technical information for a proposed satellite system specified in paragraph (c) of this section must be filed on FCC Form 312, Main Form and Schedule S. The technical information for a proposed satellite system specified in paragraph (d) of this section need not be filed on any prescribed form but should be complete in all pertinent details. Applications for new space station authorizations other than authorizations for the Direct Broadcast Service (DBS) and Digital Audio Radio Satellite (DARS) service must be filed electronically through the International Bureau Filing System (IBFS).

(c) The following information shall be filed on FCC Form 312, Main Form and Schedule S:

- (1) Name, address, and telephone number of the applicant;
- (2) Name, address, and telephone number of the person(s), including counsel, to whom inquiries or correspondence should be directed;
- (3) Type of authorization requested (e.g., launch authority, station license, modification of authorization);
 - (i) Radio frequencies and polarization plan (including beacon, telemetry, and telecommand functions), center frequency and polarization of transponders (both receiving and transmitting frequencies),
 - (ii) Emission designators and allocated bandwidth of emission, final amplifier output power (identify any net losses between output of final amplifier and input of antenna and specify the maximum EIRP for each antenna beam),
 - (iii) Identification of which antenna beams are connected or switchable to each transponder and TT&C function,
 - (iv) Receiving system noise temperature,
 - (v) The relationship between satellite receive antenna gain pattern and gain-to-temperature ratio and saturation flux density for each antenna beam (may be indicated on antenna gain plot),
 - (vi) The gain of each transponder channel (between output of receiving antenna and input of transmitting antenna) including any adjustable gain step capabilities, and
 - (vii) Predicted receiver and transmitter channel filter response characteristics.
- (5) For satellites in geostationary-satellite orbit,
 - (i) Orbital location, or locations if alternatives are proposed, requested for the satellite,
 - (ii) The factors that support the orbital assignment or assignments proposed in paragraph (c)(5)(i) of this section,
 - (iii) Longitudinal tolerance or east-west station-keeping capability,
 - (iv) Inclination incursion or north-south station-keeping capability.
- (6) For satellites in non-geostationary-satellite orbits,
 - (i) the number of space stations and applicable information relating to the number of orbital planes,
 - (ii) the inclination of the orbital plane(s),
 - (iii) the orbital period,

- (iv) the apogee,
 - (v) the perigee,
 - (vi) the argument(s) of perigee,
 - (vii) active service arc(s), and
 - (viii) right ascension of the ascending node(s).
- (7) For satellites in geostationary-satellite orbit, accuracy with which the orbital inclination, the antenna axis attitude, and longitudinal drift will be maintained;
- (8) Calculation of power flux density levels within each coverage area and of the energy dispersal, if any, needed for compliance with §25.208, for angles of arrival of 5°, 10°, 15°, 20°, and 25° above the horizontal;
- (9) Arrangement for tracking, telemetry, and control;
- (10) Physical characteristics of the space station including weight and dimensions of spacecraft, detailed mass (on ground and in-orbit) and power (beginning and end of life) budgets, and estimated operational lifetime and reliability of the space station and the basis for that estimate;
- (11) A clear and detailed statement of whether the space station is to be operated on a common carrier basis, or whether non-common carrier transactions are proposed. If non-common carrier transactions are proposed, describe the nature of the transactions and specify the number of transponders to be offered on a non-common carrier basis;
- (12) Dates by which construction will be commenced and completed, launch date, and estimated date of placement into service.
- (13) The polarization information specified in Sections 25.210(a)(1), (a)(3), and (i) of this chapter, to the extent applicable.
- (d) The following information in narrative form shall be contained in each application:
- (1) General description of overall system facilities, operations and services;
 - (2) If applicable, the feeder link and inter-satellite service frequencies requested for the satellite, together with any demonstration otherwise required by this chapter for use of those frequencies (see, e.g., §25.203(j) and (k));
 - (3) Predicted space station antenna gain contour(s) for each transmit and each receive antenna beam and nominal orbital location requested. These contour(s) should be plotted on an area map at 2 dB intervals down to 10 dB below the peak value of the parameter and at 5 dB intervals between 10 dB and 20 dB below the peak values, with the peak value and sense of polarization clearly specified on each plotted contour. For applications for geostationary orbit satellites, this information must be provided in the .gxt format.
 - (4) A description of the types of services to be provided, and the areas to be served, including a description of the transmission characteristics and performance objectives for each type of proposed service, details of the link noise budget, typical or baseline earth station parameters, modulation parameters, and overall link performance analysis (including an analysis of the effects of each contributing noise and interference source);
 - (5) Calculation of power flux density levels within each coverage area and of the energy dispersal, if any, needed for compliance with §25.208; Calculation of power flux density levels within each coverage area and of the energy dispersal, if any, needed for compliance with §25.208, for angles of arrival other than 5°, 10°, 15°, 20°, and 25° above the horizontal.
 - (6) Public interest considerations in support of grant;
 - (7) Applications for authorizations for fixed-satellite space stations shall also include the information specified in §25.140;
 - (8) Applications for authorizations in the Mobile-Satellite Service in the 1545-1559/1646.5-1660.5 MHz frequency bands shall also provide all information necessary to comply with the policies and procedures set forth in Rules and Policies Pertaining to the Use of Radio

Frequencies in a Land Mobile Satellite Service, 2 FCC Rcd 485 (1987) (Available at address in §0.445 of this chapter.);

(9) Applications to license multiple space station systems in the non-voice, non-geostationary mobile-satellite service under blanket operating authority shall also provide all information specified in §25.142; and

(10) Applications for authorizations in the 1.6/2.4 GHz Mobile-Satellite Service shall also provide all information specified in §25.143.

(11) In addition to a statement of whether the space station is to be operated on a common carrier basis, or whether non-common carrier transactions are proposed, as specified in paragraph (c)(11) of this section, satellite applications in the Direct Broadcast Satellite service must provide a clear and detailed statement of whether the space station is to be operated on a broadcast or non-broadcast basis.

(12) Applications for authorizations in the non-geostationary satellite orbit fixed-satellite service (NGSO FSS) in the bands 10.7 GHz to 14.5 GHz shall also provide all information specified in § 25.146.

(13) For satellite applications in the Direct Broadcast Satellite service, if the proposed system's technical characteristics differ from those specified in the Appendix 30 BSS Plans, the Appendix 30A feeder link Plans, Annex 5 to Appendix 30 or Annex 3 to Appendix 30A, each applicant shall provide:

(i) the information requested in Appendix 4 of the ITU's Radio Regulations. Further, applicants shall provide sufficient technical showing that the proposed system could operate satisfactorily if all assignments in the BSS and feeder link Plans were implemented.

(ii) analyses of the proposed system with respect to the limits in Annex 1 to Appendices 30 and 30A.

(e) Applicants requesting authority to launch and operate a system comprised of technically identical, non-geostationary satellite orbit space stations may file a single "blanket" application containing the information specified in paragraphs (c) and (d) of this section for each representative space station.

5. Amend § 25.115 by revising paragraph (a) to read as follows:

§ 25.115 Application for earth station authorizations.

(a) Transmitting earth stations. Except as provided under § 25.113(b) of this Chapter, Commission authorization must be obtained for authority to construct and/or operate a transmitting earth station. Applications shall be filed on FCC Form 312, Main Form and Schedule B, and include the information specified in § 25.130. In cases where an application is for a transmitting earth station facility that (1) will transmit in the 3700-4200 MHz and 5925-6425 MHz band, and/or the 11.7-12.2 GHz and 14.0-14.5 GHz band, and (2) will meet all the applicable technical specifications set forth in Part 25 of this Chapter, the application must be filed electronically through the International Bureau Filing System (IBFS). Applications for other earth station applications are permitted but not required to be filed electronically. Any party choosing to file an earth station application electronically must file in accordance with the pleading limitations, periods and other applicable provisions of §§ 1.41 through 1.52 of this chapter;

* * * * *

6. Amend § 25.117 by revising paragraphs (a), (b), and (c), and removing paragraph (e), to read as follows:

§25.117 Modification of station license.

(a) Except as provided for in § 25.118 (Modifications not requiring prior authorization), no modification of a radio station governed by this part which affects the parameters or terms and conditions of the station authorization shall be made except upon application to and grant of such application by the Commission.

(b) [Reserved]

(c) Applications for modification of earth station authorizations shall be submitted on FCC Form 312, Main Form and Schedule B. Applications for modification of space station authorizations shall be submitted on FCC Form 312, Main Form and Schedule S. In addition, any application for modification of authorization to extend a required date of completion, as set forth in Section 25.133 of this Chapter for earth station authorization or Section 25.164 of this Chapter for space stations, or included as a condition of any earth station or space station authorization, must include a verified statement from the applicant:

(1) That states the additional time is required due to unforeseeable circumstances beyond the applicant's control, describes these circumstances with specificity, and justifies the precise extension period requested; or

(2) That states there are unique and overriding public interest concerns that justify an extension, identifies these interests and justifies a precise extension period.

(d) • • •

(e) [reserved.]

* * * * *

7. Amend § 25.118 by revising paragraphs (a) and (b), and removing and reserving paragraphs (c) and (d), to read as follows:

§25.118 Modifications not requiring prior authorization.

(a) *Earth Station License Modifications, Notification Required.* Authorized earth station operators may make the following modifications to their licenses without prior Commission authorization, provided that the operators notify the Commission, using FCC Form 312 and Schedule B, within 30 days of the modification:

(1) Licensees may make changes to their authorized earth stations without obtaining prior Commission authorization, provided that they have complied with all applicable frequency coordination procedures in accordance with § 25.251, and the modification does not involve:

(i) An increase in EIRP or EIRP density (both main lobe and side lobe);

(ii) An increase in transmitted power;

(iii) A change in coordinates of more than 1 second in latitude or longitude for stations operating in frequency bands that are shared with terrestrial systems; or

(iv) A change in coordinates of 10 seconds or greater in latitude or longitude for stations operating in frequency bands that are not shared with terrestrial systems.

(2) Except for replacement of equipment where the new equipment is electrically identical to the existing equipment, an authorized earth station licensee may add, change or replace transmitters or antenna facilities without prior authorization, provided:

(i) The added, changed, or replaced facilities conform to Section 25.209 of this Chapter;

(ii) The particulars of operations remain unchanged;

(iii) Frequency coordination is not required; and

(iv) The maximum power and power density delivered into any antenna at the earth station site shall not exceed the values calculated by subtracting the maximum antenna gain specified in the license from the maximum authorized e.i.r.p. and e.i.r.p. density values.

(3) Authorized VSAT earth station operators may add VSAT remote terminals without prior authorization, provided that they have complied with all applicable frequency coordination procedures in accordance with § 25.251.

(4) A licensee providing service on a private carrier basis may change its operations to common carrier status without obtaining prior Commission authorization. The licensee must notify the Commission using Form 312 within 30 days after the completed change to common carrier status.

(5) Earth station operators may change their points of communication without prior authorization, provided that the change results from a space station license modification described in paragraph (e) of this Section, and the earth station operator does not repoint its antenna.

(b) *Earth Station License Modifications, notification not required.* Notwithstanding paragraph (a)(2) of this section, equipment in an authorized earth station may be replaced without prior authorization and without notifying the Commission if the new equipment is electrically identical to the existing equipment.

(c) [reserved.]

(d) [reserved.]

8. Amend § 25.121 by revising paragraph (e) to read as follows:

§ 25.121 License term and renewals.

(e) Renewal of licenses. Applications for renewals of earth station licenses must be submitted on FCC Form 312R no earlier than 90 days, and no later than 30 days, before the expiration date of the license. Applications for space station system replacement authorization for non-geostationary orbit satellites shall be filed no earlier than 90 days, and no later than 30 days, prior to the end of the twelfth year of the existing license term.

9. Amend § 25.131 by revising paragraphs (h) and (i) to read as follows:

§ 25.131 Filing requirements for receive-only earth stations.

(h) Registration term: Registrations for receive-only earth stations governed by this section will be issued for a period of 15 years from the date on which the application was filed. Applications for renewals of registrations must be submitted on FCC Form 312R (Application for Renewal of Radio Station License in Specified Services) no earlier than 90 days and no later than 30 days before the expiration date of the registration.

(i) Applications for modification of license or registration of receive-only earth stations shall be made in conformance with §§ 25.117 and 25.118. In addition, registrants are required to notify the Commission when a receive-only earth station is no longer operational or when it has not been used to provide any service during any 6-month period.

§ 25.141 [Removed]

10. Remove §25.141.

Subpart H [Removed]

11. Part 25 is amended by removing and reserving subpart H.

APPENDIX C

Schedule S as Proposed in the *Space Station Reform NPRM*

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
(Technical and Operational Description)

S1. GENERAL INFORMATION Complete for all satellite applications.

a. Space Station or Satellite Network Name:	e. Estimated Date of Placement into Service:	i. Total Transponder Bandwidth (No. Transponders x Bandwidth) MHz
b. Construction Commencement Date:	f. Estimated Lifetime of Satellite(s) Years	j. Number of transponders offered on a non-common carrier basis:
c. Construction Completion Date:	g. Will the space station(s) operate on a Common Carrier basis? <input type="checkbox"/> YES <input type="checkbox"/> NO	k. Total Non-Common Carrier Transponder Bandwidth MHz
d. Estimated Launch Date:	h. Total Number of Transponders:	l. Orbit Type: <input type="checkbox"/> GSO <input type="checkbox"/> NGSO

S2. OPERATING FREQUENCY BANDS Identify the frequency range and transmit/receive mode for all frequency bands in which this station will operate.
Also indicate the nature of service(s) for each frequency band.

Frequency Band Limits		c. T/R Mode	d. Nature of Service(s): List all that apply to this band
a. Lower Frequency (MHz)	b. Upper Frequency (MHz)		

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W):	h. Alternate Orbital Locations (Degrees E/W):		c. Reason for orbital location selection
Longitudinal Tolerance or E/W Station-Keeping:	f. Inclination Excursion or N/S Station-Keeping Tolerance:	Range of orbital arc in which adequate service can be provided: _____ Degrees E/W	
d. Toward West: _____ Degrees		g. From West: _____	
e. Toward East: _____ Degrees		h. To East: _____	
i. Reason for service arc selection:			

Page 2: NGSO Orbits

S4a. Total Number of Satellites in Network or System: _____ S4c. Celestial Reference Body (Earth, Sun, Moon, etc.): _____
S4b. Total Number of Orbital Planes in Network or System: _____ S4d. Orbit Epoch Date: _____

[illegible][illegible]

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

S7. SERVICE AREA CHARACTERISTICS For each service area provide:

[illegible]

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

S8. ANTENNA BEAM DIAGRAMS For each beam pattern provide the reference to the graphic image and numerical data. Also provide the power flux density levels in each beam that result from the emission with the highest power flux density.

Also provide the power flux density levels in each beam that result from the emission with the highest power flux density.

(a) Beam ID	(b) T/R Mode	(c) Co- or Polar Mode ("C" or "X")	(d) Ref Orbital Longitude (Deg. E/W)	(e) Antenna Gain (Contour Diagram Map (Figure No.)	(f) Antenna Gain (Contour Data (GXT File or Table No.)	(g) 5 Deg	(h) 10 Deg	(i) 15 Deg	(j) 20 Deg	(k) 25 Deg
<p>Max. Power Flux Density (dBW/41Hz/m2)</p> <p>At Angle of Arrival above horizontal (for emission with highest PFD)</p>										

Page 6: Channels and Transponders

S10. SPACE STATION TRANSPONDERS** For each transponder provide:

[illegible][illegible]

* Also complete this table for half-links such as TT&C and on-board processing. In such cases, provide the receive or transmit information, as appropriate.

Page 7: Typical Emissions

[illegible]FCC 312, Schedule S - Page 7
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Page 8: Digital Modulation

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[illegible]

FCC Form 312 - Schedule S: (Technical and Operational Description)

S13. ANALOG MODULATION PARAMETERS

[illegible]

*Indicate whether signal is (a) FDM/FM, (b) CSSB/AM, (c) SCPC/FM, or (d) TV/FM.

FCC Form 312 - Schedule S: (Technical and Operational Description)

NO ☐ YES ☐

S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					
S14a. Street Address		S14b. City		S14c. County		S14d. State / Country		S14e. Zip Code	
S14f. Telephone Number		S14g. Call Sign of Control Station (if appropriate)		S14h. Call Sign of Control Station (if appropriate)					

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**FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)**

**Page 11: Characteristics &
Certifications**

S15. SPACECRAFT PHYSICAL CHARACTERISTICS

S15a. Mass of spacecraft without fuel (kg)	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (%)
S15b. Mass of fuel & disposables at launch (kg)		
S15c. Mass of fuel at beginning of life (kg)	S15f. Length (m)	S15i. Payload (%)
S15d. Mass of spacecraft and fuel at launch (kg)	S15g. Width (m)	S15j. Bus (%)
S15e. Deployed Area of Solar Array (square meters)	S15h. Height (m)	S15k. Total (%)

S16. SPACECRAFT ELECTRICAL CHARACTERISTICS

Spacecraft Subsystem	Electrical Power (Watts) At Beginning of Life		Electrical Power (Watts) At End of Life	
	At Equinox	At Solstice	At Equinox	At Solstice
Payload (Watts)	(a)	(f)	(k)	(p)
Bus (Watts)	(b)	(g)	(l)	(q)
Total (Watts)	(c)	(h)	(m)	(r)
Solar Array (Watts)	(d)	(i)	(n)	(s)
Depth of Battery Discharge (%)	(e) %	(j) %	(o) %	(t) %

S17. CERTIFICATIONS

a. Are the power flux density limits of § 25.208 met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> N/A
b. Are the appropriate service area coverage requirements of § 25.143(b)(ii) and (iii), or § 25.145(c)(1) and (2) met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> N/A
b. Are the frequency tolerances of § 25.202(e) and the out-of-band emission limits of § 25.202(f)(1), (2), and (3) met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> N/A

In addition to the information required in this Form, the space station applicant is required to provide all the information specified in Section 25.114 of the Commission's rules, 47 C.F.R. § 25.114.

APPENDIX D

Schedule S as Revised in this Order

FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
(Technical and Operational Description)Page 1: General,
Frequency Bands,
and GSO Orbit

S1. GENERAL INFORMATION Complete for all satellite applications.

a. Space Station or Satellite Network Name:	e. Estimated Date of Placement into Service:	i. Will the space station(s) operate on a Common Carrier basis? <input type="checkbox"/> YES <input type="checkbox"/> NO
b. Construction Commencement Date:	f. Estimated Lifetime of Satellite(s): Years	j. Number of transponders offered on a Common Carrier basis:
c. Construction Completion Date:	g. Total Number of Transponders:	k. Total Common Carrier Transponder Bandwidth: MHz
d. Estimated Launch Date:	h. Total Transponder Bandwidth (No. Transponders x Bandwidth): MHz	l. Orbit Type: Mark all boxes that apply. <input type="checkbox"/> GSO <input type="checkbox"/> NCGSO

S2. OPERATING FREQUENCY BANDS Identify the frequency range and transmit/receive mode for all frequency bands in which this station will operate.
Also indicate the nature of service(s) for each frequency band.

Frequency Band Limits				e. T/R Mode	f. Nature of Service(s): List all that apply to this band
Lower Frequency (Hz)		Upper Frequency (Hz)			
a. Numeric	b. Unit (K/M/G)	c. Numeric	d. Unit (K/M/G)		

S3. ORBITAL INFORMATION FOR GEOSTATIONARY SATELLITES ONLY:

a. Nominal Orbital Longitude (Degrees E/W):			b. Reason for orbital location selection:		
Longitudinal Tolerance or E/W Station-Keeping:		e. Inclination Excursion or N/S Station-Keeping Tolerance:			Range of orbital arc in which adequate service can be provided (Optional):
c. Toward West: _____ Degrees		_____ Degrees			f. Westernmost: _____
d. Toward East: _____ Degrees		_____ Degrees			g. Easternmost: _____
h. Reason for service arc selection (Optional):					

Page 2: NGSO Orbits

S4a. Total Number of Satellites in Network or System: _____ S4c. Celestial Reference Body (Earth, Sun, Moon, etc.): _____
S4b. Total Number of Orbital Planes in Network or System: _____ S4d. Orbit Epoch Date: _____

[illegible][illegible]

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FEDERAL COMMUNICATIONS COMMISSION
SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

Page 3: Service Areas

S6. SERVICE AREA CHARACTERISTICS For each service area provide:

[illegible]

Rev 4d, June 19, 2003, 5:45 pm

ERIC: J12, Schedule 5 - Page 3
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SATELLITE SPACE STATION AUTHORIZATIONS
FCC Form 312 - Schedule S: (Technical and Operational Description)

S7. SPACE STATION ANTENNA BEAM CHARACTERISTICS

[illegible]

Page 5: Beam Diagrams

S8. ANTENNA BEAM DIAGRAMS For each beam pattern provide the reference to the graphic image and numerical data. Also provide the power flux density levels in each beam that result from the emission with the highest power flux density.

[illegible]

*Use a Reference Bandwidth of 4 kHz or 1 MHz as appropriate to the FCC Rules that apply to the subject frequency band (§ 25.208).

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Page 6: Channels and Transponders

S10. SPACE STATION TRANSPONDERS** For each transponder provide:

[illegible][illegible]

**Also complete this table for half-links such as T/T&C and on-board processing. In such cases, provide the receive or transmit information, as appropriate.

Rev 4d, June 19, 2003, 5:45 pm

Page 7: Digital Modulation

[illegible]

Page 8: Analog Modulation

S12. ANALOG MODULATION PARAMETERS For each analog emission provide:[illegible]

*Indicate whether signal is (a) FDM/FM, (b) CSSB/AM, (c) SCPC/FM, or (d) TV/FM.
Rev 4d, June 19, 2003, 5:45 pm

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Page 9: Typical Emissions

S13. TYPICAL EMISSIONS For each planned type of emission provide:

[illegible]

* For those emissions using energy dispersal, provide the bandwidth of the energy dispersal. Otherwise, leave blank.
 ** Use a Reference Bandwidth of 4 kHz or 1 MHz as appropriate to the FCC Rules that apply to the subject frequency band (§ 25.208).
 Rev 4d, June 19, 2003, § 5: 45 pm

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S14. Is the space station(s) controlled and monitored remotely? If YES, provide the location and telephonic number of the TT&C control point(s).

Remote Control (TT&C) Location(s):

S14a. Street Address			
S14b. City	S14c. County	S14d. State / Country	S14e. Zip Code
S14f. Telephone Number			
S14g. Call Sign of Control Station (if appropriate)			
S14a. Street Address			
S14b. City	S14c. County	S14d. State / Country	S14e. Zip Code
S14f. Telephone Number			
S14g. Call Sign of Control Station (if appropriate)			
S14a. Street Address			
S14b. City	S14c. County	S14d. State / Country	S14e. Zip Code
S14f. Telephone Number			
S14g. Call Sign of Control Station (if appropriate)			
S14a. Street Address			
S14b. City	S14c. County	S14d. State / Country	S14e. Zip Code
S14f. Telephone Number			
S14g. Call Sign of Control Station (if appropriate)			
S14a. Street Address			
S14b. City	S14c. County	S14d. State / Country	S14e. Zip Code
S14f. Telephone Number			
S14g. Call Sign of Control Station (if appropriate)			

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Page 11: Characteristics &
Certifications

S15. SPACECRAFT PHYSICAL CHARACTERISTICS

S15a. Mass of spacecraft without fuel (kg)	Spacecraft Dimensions (meters)	Probability of Survival to End of Life (0.0 - 1.0)
S15b. Mass of fuel & disposables at launch (kg)		
S15c. Mass of spacecraft and fuel at launch (kg)	S15f. Length (m)	S15i. Payload
S15d. Mass of fuel, in orbit, at beginning of life (kg)	S15g. Width (m)	S15j. Bus
S15e. Deployed Area of Solar Array (square meters)	S15h. Height (m)	S15k. Total

S16. SPACECRAFT ELECTRICAL CHARACTERISTICS

Spacecraft Subsystem	Electrical Power (Watts) At Beginning of Life		Electrical Power (Watts) At End of Life	
	At Equinox	At Solstice	At Equinox	At Solstice
Payload (Watts)	(s)	(f)	(k)	(p)
Bus (Watts)	(b)	(g)	(l)	(q)
Total (Watts)	(c)	(h)	(m)	(r)
Solar Array (Watts)	(d)	(i)	(n)	(s)
Depth of Battery Discharge (%)	(e) %	(j) %	(o) %	(t) %

S17. CERTIFICATIONS

a. Are the power flux density limits of § 25.208 met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> N/A
b. Are the appropriate service area coverage requirements of § 25.143(b)(ii) and (iii), or § 25.145(c)(1) and (2) met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> N/A
c. Are the frequency tolerances of § 25.202(e) and the out-of-band emission limits of § 25.202(f)(1), (2), and (3) met?	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> N/A
<p>In addition to the information required in this Form, the space station applicant is required to provide all the information specified in Section 25.114 of the Commission's rules, 47 C.F.R. § 25.114.</p>			